less accurate and very tedious process of determining their positions by means of a lower power eyepiece furnished with a ring, letter N, or cross-bar micrometer, which would permit observation of faint stars in a dark field. I remember giving many fine nights, spread over some weeks, to approximately fixing the positions of a comparatively small number of stars about the *Nova*, and I likewise spent a good deal of time for the same purpose in the region surrounding the supposed position of Tycho Brahe's *Nova* of 1572, and intended to proceed in a similar way with other regions about "new" stars; but the tediousness of those methods of observation did not seem to justify one, in view of other and more important work, in expending more time over it, so it was never completed.

With modern methods which have rendered such work so easy I could not let pass the opportunity of securing *photographs* of *Nova Persei* and neighbouring stars at the earliest possible moment.

Observations of the New Star in Perseus made at the Radcliffe Observatory, Oxford.

(*Communicated by Arthur A. Rambaut, M.A., Sc.D., F.R.S., Radcliffe Observer.*)

Since the receipt of the telegram announcing its discovery, observations have been made of Dr. Anderson's new star at the Radcliffe Observatory on every evening that the weather permitted.

On February 23 and 24 the sky was almost continuously overcast, and the star was not seen by us until the evening of the 25th. At this time its magnitude appeared to be 0·9.

The observations include transit-circle determinations of the position of the star on four afternoons, a spectroscopic examination of the light on two evenings, measures of its brightness made with a wedge photometer, and eye-estimates of its brightness as compared with several of the brighter stars.

The transit-circle observations and photometric measures will be published in due time when they have been more fully discussed. The present notice is chiefly concerned with the eye-estimates of magnitude.

In making these comparisons the magnitudes of the Harvard Photometry have been adopted, and the observers have estimated the difference between the *Nova* and each comparison star in tenths of a magnitude. In the results given below no correction has been applied for the atmospheric absorption of light, but as, for the most part, the comparison stars have been taken at various altitudes both above and below the *Nova*, the effect of the absorption

would tend to be eliminated in the mean, and the results of the separate comparisons made on the same occasion show that the means may be relied on to within two or three tenths of a magnitude. On only one occasion was the correction for absorption applied. That was in the comparison made by A.A.R. with Rigel on February 26. At the time of the comparison this star was at a zenith distance of 69° 4′, and in this position the absorption of light would amount to nearly half a magnitude. When the correction for absorption was applied, however, this comparison agreed closely with the others.

The colour of the star has undergone a remarkable change during the short time it has been under observation. Whereas at the time of its discovery, and even up to February 25, when we first saw it, the colour was noted as being bluish white, it has been becoming notably redder from night to night. This change in the colour of the star makes eye-comparisons with the whiter stars a little difficult, and may be to some extent responsible for the differences between the estimates made by one observer and another.

It is, perhaps, premature to conclude that there have been variations in the rate of diminution of the light, but the irregularities in the curve of magnitudes seem to be rather greater than might be expected to arise from errors of observation.

In Table I., below, are given a number for reference, the names of the comparison stars used and the Harvard magnitudes on which our estimates are based.

Table II. contains the separate comparisons and remarks relating to the colour, &c.

Table III. contains the means of each observer's separate comparisons and the general mean for each night.

TABLE I.

List of Stars used for Comparison with Nova Persei.

Ref. No.	Name of Star.	Harvard Photom. Mag.	Ref. No.	Name of Star.	Harvard Photom. Mag.
1	Capella	0·18	13	β Tauri	1·90
2	Rigel	0·32	14	α Persei	1·94
3	Procyon	0·46	15	α Ursæ Maj.	1·96
4	α Orionis	0·91	16	η Ursæ Maj.	2·02
5	Aldebaran	1·00	17	β Aurigæ	2·07
6	Pollux	1·12	18	β Ursæ Min.	2·13
7	Regulus	1·42	19	γ Androm.	2·14
8	Castor	1·56	20	Polaris	2·15
9	ε Orionis	1·76	21	α Cassiop. (var.)	2·25
10	ε Ursæ Maj.	1·85	22	γ Cassiop.	2·30
11	γ Orionis	1·86	23	Algol (var.)	2·31
12	ζ Orionis	1·89	24	δ Orionis	2·36

Ref. No.	Name of Star.	Harvard Photom. Mag.	Ref. No.	Name of Star.	Harvard Photom. Mag.
25	ζ Ursæ Maj.	2·38	32	γ Ursæ Min.	3·18
26	β Cassiop.	2·42	33	δ Ursæ Maj.	3·41
27	γ Ursæ Maj.	2·56	34	ϵ Cassiop.	3·55
28	δ Cassiop.	2·84	35	η Cassiop.	3·64
29	ϵ Persei	3·04	36	ζ Cassiop.	3·74
30	γ Persei	3·11	37	η Persei	3·93
31	δ Persei	3·18			

Table II.

The following observations of magnitude and notes of colour were taken :—

1901.	G.M.T. h m	Observer.	Reference Stars.	Resulting Mag.
Feb. 25	6 45	R.	1, 14	1·0
	7 0	W.	2	0·8
		,,	14	0·9
		,,	23	0·8
		,,	5	0·7
		,,	4	1·0
Feb. 25	7 0	W.	14	0·9
	7 30	,,	3	0·7
		,,	8	0·6*
		,,	1	0·9
		,,	4	1·1
		,,	3	1·0

Notes.

Observer R. Nova, bluish; Capella, yellow.

Observer W. The first six estimations were made with the 10-inch equatorial, with different powers, the remainder with naked eye. With power 100, colour of Nova bluish-white; occasionally a red marginal fringe is noticeable. Power 45: Algol, light yellow, no red fringe. Power 180: Nova, bluish-white; α Persei, light yellow; α Orionis, reddish-yellow; Aldebaran, strong yellow; Rigel, very blue.

Feb. 26	9 30	A.A.R.	23, 14, 8, 6, 2, 31	1·0
	9 47	W.	5	1·2
			1	1·0
			14	1·4
			23	0·6
			4	1·3
			17, 1	1·1
Feb. 26	10 0	W.	6	1·3
			7	1·4
	10 35		3	1·5
			14	1·1
			17, 1	1·1
			4	1·4
			23	0·6
	10 0	R.	14, 1	1·4

Notes.—Observer A.A.R. By method of sequence. At 9h 30m, observer C., Nova is about 0·25 mag. fainter than it was February 25 8h.

1901.	G.M.T.	Observer.	Reference Stars.	Resulting Mag.	1901.	G.M.T.	Observer.	Reference Stars.	Resulting Mag.
	h m					h m			
Feb. 27	7 15	W.	14	1·6	Feb. 27	7 15	W.	17	1·6
			8	1·6*		7 20	R.	5	1·6
			5	1·5				14	1·5
			1	1.2				23	1·6

Note.—Observer W. The comparisons with Capella and β Aurigæ are approximate only. Clouds passing.

Feb. 28	7 0	R.	5	1·6	Feb. 28	8 0	W.	10	1·6
			14	1·6		8 10		20	1·8
			23	1·7		9 45	C.	14	1·4
	8 0	W.	14	1·7				23	1·5
			23	1·6				17	1·6
			17	1·8				8	1·0*
			1	1·9				20	1·4 ($\frac{1}{2}$ wt.)
			4	1·6				15	1·3 „
			5	1·4				10	1·3 „
			7	1·7				6	1·3
			15	1·7					

Notes.—Observer W. Twilight observation at 6^h 15^m. Capella, very distinct; Nova, distinct; α Persei and Algol, invisible. At 6.30, α and ϵ Persei and Capella now visible. Nova appears brighter than α Persei and β Aurigæ. From 8^h moonlight strong, but Moon screened from observer.

Mar. 1	4 54	R.	14	1·9	Mar. 1	8 0	W.	9	1·4 ($\frac{1}{2}$ wt.)
	6 30	A.A.R.	14	2·0				24	2·0 ($\frac{1}{2}$ wt.)
			23	2·0				8	1·6*
	6 30	W.	14	1·9				20	2·4
			23	1·8				25, 16	2·2
	8 0	„	14	2·1				18	2·1
			23	2·0		7 15	R.	14	1·9
			17	1·9				23	2·0
			11	1·9		8 0	C.	14	1·9
			12	1·5 ($\frac{1}{2}$ wt.)		11 30	A.A.R.	23, 14	2·1

Notes.

Observed with transit circle, R. Nova yellow, with reddish tinge; α Persei yellow; strong contrast with Nova when at edge of field.

Observer W. Nova is reddish-yellow by contrast with α Persei and Algol. Strong moonlight troublesome. Comparison with Castor difficult; Moon near.

* Comparisons with Castor seem to indicate that the Harvard magnitude of this star is 0·3 mag. brighter than the Radcliffe estimations. On Feb. 27, 28, and Mar. 1, the Moon was near. The comparisons have not been used for Table III.

1901.	G.M.T. h	m	Observer.	Reference Stars.	Resulting Mag.	1901.	G.M.T. h	m	Observer.	Reference Stars.	Resulting Mag.
Mar. 2	12	0	R.	14	2·1	Mar. 2	12	0	R.	13, 14	1·9
				23	2·0						

Notes.—Nova is reddish; Algol and β Tauri are both bluish.

Mar. 3	9	15	R.	14	2·2	Mar. 3	9	15	R.	29	2·3
				13	2·0					31	2·3
				23	2·2						

Notes.—α Persei, yellow; Nova, reddish; Algol, blue.

Mar. 4	Cloudy.										
Mar. 5	7	8	W.	14	2·4	Mar. 5	7	8	W.	34	2·5
				23	2·6					28	2·5
				17	2·4					22	2·5
				11	2·4					35	2·1
				12	2·1					21	2·3
				9	2·1					26	2·5
				24	2·2		7	8	R.	14	2·5
				8	2·0*					23	2·5
				20	2·4					29	2·6
				18	2·4					31	2·6

Notes.

Observed with transit circle, C. Nova reddish-yellow and fainter than α Persei.

Observer W. Moon very low in the east. Nova is very red to-night, equal to Aldebaran's tint.

Observer R. Nova is orange-red, deeper in colour than Aldebaran, α Orionis, or Mars. Algol is bluish-white.

Mar. 6	6	30	W.	23, 29	2·7	Mar. 6	8	15	W.	35	3·3
	6	50	R.	29	2·9					36	3·2
				31	2·9					19	2·6
				23	2·8					14	3·4
	8	15	W.	20	3·4					29	3·0
				18	3·3					31	2·9
				32	3·0					30	3·0
				34	3·1					37	3·4
				28	3·0		8	45		27, 33	3·0
				22	2·7		9	45	C.	31	3·0
				26	2·7					29	3·0
				21	2·6						

Notes.

Observer W. In strong twilight at $6^h\ 20^m$: Capella, β Aurigæ, and α Persei visible; Algol and Nova, as yet, invisible. At 6.30 Nova easily visible, but ϵ Persei seen only at times. At 8.15–45, stars scintillating; much haze; colour of Nova is decidedly red. Half weight should be given to comparisons with Polaris, γ Andromedæ, and α Persei.

Observer R. Observed in clear breaks.

TABLE III.

Means of Estimations of Magnitude of Nova Persei.

1901.	G.M.T. h m	Observer.	Mean Mags.	No. of Comparisons.	Adopted Magnitude for the Night.
Feb. 25	6.45	R.	1·0	2	0·90
	7.30	W.	0·85	6 (Equatorial)	
	7.30	W.	0·91	4 (Eye)	
26	9.30	A.A.R.	0·95	2	1·17
	10.11	W.	1·17	13	
	10.0	R.	1·4	2	
27	7.15	W.	1·47	4	1·50
	7.20	R.	1·53	3	
28	7.0	R.	1·65	3	1·58
	8.5	W.	1·67	10	
	9.45	C.	1·41	7	
Mar. 1	4.54	R.	1·94	1	1·99
	6.30	A.A.R.	2·03	2	
	6.30	W.	1·88	2	
	7.15	R.	1·96	2	
	8.0	W.	2·01	10	
	8.0	C.	1·94	1	
	11.30	A.A.R.	2·13	2	
2	12.0	R.	2·05	3	2·05
3	9.15	R.	2·20	5	2·20
5	7.8	W.	2·36	15	2·42
	7.8	R.	2·54	4	
6	6.30	W.	2·67	2	2·95
	6.50	R.	2·88	3	
	8.30	W.	3·03	17	
	9.45	C.	3·01	2	

The observers were: Dr. Rambaut, indicated by A.A.R.
Mr. Wickham, „ W.
Mr. Robinson, „ R.
Mr. McClellan, „ C.

Spectroscopic Observations.—On February 26 and March 5 the light of the star was examined with a small single prism spectroscope attached to the 10-inch Barclay equatorial. On February 26 we found a bright continuous spectrum on which were superposed several bright lines. The most conspicuous of these were one near the extreme red end of the spectrum which was taken to be C, one faint one in the orange (most probably D), and two in the green, of which the *less* refrangible was the brighter. The more refrangible of these lines was taken to be F, or possibly Hγ. There were several other faint lines not identified. A bright patch was noticed in the violet, which was so condensed as to suggest a bright line out of focus. There were strong absorption bands in the orange and green, which W. at one time thought could be resolved into a series of very close dark lines.

On March 5 the general appearance of the spectrum was very similar. The absorption in the red just above C (?) and in the blue just above F (?) was very strongly marked. The C (?) line was relatively much more brilliant than on February 26, which may account for the increased redness in the light of the star, while the *more* refrangible of the two green lines now appeared the brighter. Numerous other faint lines were noticed.

Radcliffe Observatory, Oxford:
1901 *March* 7.

Addendum.

The following estimations were made last night :—

1901.	G.M.T.	Observer.	Ref. Stars.	Resulting Mag.	Adopted Magnitude for the Night.
Mar. 7	11.50	W.	29	2·8	
			31	2·7	
	11.52	R.	29	2·7	
			31	2·8	2·77
			30	2·9	
			14	2·7	

Notes.

W.—I think Nova is brighter than last evening, and not nearly so red.

R.—Nova has brightened, and is very red, but stars' images are scintillating considerably.

Radcliffe Observatory, Oxford:
1901 *March* 8.

The Variable Star R Centauri. By Alex. W. Roberts, D.Sc.

The southern variable star *R Centauri* (Ch. 5096) is a very fine example of a distinct and well-defined type of long-period variation, the type where each full light period consists of a double maximum and double minimum.

There are long-period variables that exhibit no secondary phase whatever, their variation being very regular.

For example, *S Sculptoris*, *U Centauri*, *R*, *V Sagittarii*, *U Pavonis*, and *T Pavonis* belong to this type.

There are also stars that exhibit secondary phases at frequent but irregular intervals. A good example of this class is the southern variable L_2 *Puppis*.

There are, however, a few stars where the secondary phases occur with marked regularity as regards period, but some irregularity as regards magnitude. Of this class of long-period stars *R Centauri* is, I think, the best example among southern variables.

The variation of *R Centauri* was discovered by Gould in 1871.

From the date of its discovery till 1878 the star was under more or less regular observation at Cordoba. On this series of observations Dr. Gould remarks, *U. A.* p. 269 :—

"The observations might be reconciled by supposing a full period of 525 days, with epoch of principal maximum 1871 April 18, and two intermediate maxima following the principal one by 197 and 378 days respectively.

"But this is incompatible with the estimates $6\frac{1}{4}^m$ and 6^m made 1874 June 25 and 26 during observations made with the meridian circle."

Although Gould's period is somewhat in error, yet he recognised the peculiar nature of the star's variation.

R Centauri has been under observation at Lovedale since 1891, and during that time six principal and five secondary maxima have been determined.

Several secondary maxima have also been observed. The principal minima, however, as they fall as low as the 13th magnitude, are beyond the reach of the telescopes at my disposal, and so the dates of this phase have been obtained by estimation only from examination of the light curve.

The magnitudes at principal maxima, while on the average $0^m{\cdot}4$ brighter than the average of secondary maxima magnitudes, are singly sometimes fainter than the preceding maximum.

Thus the secondary maximum of 1900 April 5 is $6^m{\cdot}1$, but the following primary maximum of 1900 November 12 is only $6^m{\cdot}4$.